**Analysis Tutorial Prospectus**

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**Title:** Effects of hydrogen peroxide (H₂O₂) on the growth of different bloom-forming cyanobacteria

**Research question:**

1. How does hydrogen peroxide (H₂O₂) affect the growth of different bloom-forming cyanobacterial species?

**Objectives:**

1. Evaluate the inhibitory effects of hydrogen peroxide on the growth dynamics of various cyanobacterial bloom species.

**Approach:**

This project will employ a controlled laboratory-based experimental design to evaluate the effects of hydrogen peroxide on harmful cyanobacterial blooms. Representative bloom-forming cyanobacteria such as *Microcystis aeruginosa*, *Planktothrix agardhii*, and *Fischerella sp*. will be cultured in the laboratory at 25˚C on a12:12 h light:dark cycle at 40 µmol m-2 s1 photosynthetically active radiation (Wang et al., 2018; Yang et al., 2018). PAK 27 herbicide will be used as a source of hydrogen peroxide and will be applied at environmentally relevant concentrations ranging from low (1–5 mg/L) to high (6–10 mg/L), based on prior studies showing selective cyanobacterial suppression (Akther & Cutright, 2024; Matthijs et al., 2012). Growth dynamics will be monitored via chlorophyll-a and phycocyanin fluorescence measurements and microscopic cell counts at multiple time points (Roache-Johnson & Stephens, 2023). Graphs and visualizations will be prepared using R Studio (version 2024.09.1) employing appropriate packages (e.g., ggplot2) to analyze and illustrate trends in the dataset.

**References**

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Yang, Z., Buley, R. P., Fernandez-Figueroa, E. G., Barros, M. U., Rajendran, S., & Wilson, A. E. (2018). Hydrogen peroxide treatment promotes chlorophytes over toxic cyanobacteria in a hyper-eutrophic aquaculture pond. *Environmental Pollution*, *240*, 590-598. <https://doi.org/10.1016/j.envpol.2018.05.012>